TORQ Analysis of Commercial and Industrial Designers to Electrical Drafters

INPUT SECTION:

Transfer	Title	O*NET	Filters		
From Title:	Commercial and Industrial Designers	27-1021.00	Abilities:	Importance LeveL: 50	Weight: 1
To Title:	Electrical Drafters	17-3012.02	Skills:	Importance LeveL: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

OUTPUT SECTION:

Grand TORQ: 91

Ability TORQ		Skills TORQ		Knowledge TORQ	
Level	96	Level	88	Level	88

Gaps To Narrow if Possible

Ability	Level	Gap	Impt
Written Expression	57	7	68
Oral Comprehension	59	2	75
Written Comprehension	59	2	72
Inductive Reasoning	51	1	56
Mathematical Reasoning	42	1	50

Upgrade These Skills

Skill	Level	Gap	Impt
Active Listening	67	10	76
Active Learning	70	7	74
Critical Thinking	70	5	69

Knowledge to Add

Knowledge	Level	Gap	Impt
Design	83	6	86

LEVEL and IMPT (IMPORTANCE) refer to the Target Electrical Drafters. GAP refers to level difference between Commercial and Industrial Designers and Electrical Drafters.

ASK ANALYSIS

Ability Level Comparison - Abilities with importance scores over 50

Description	Commercial and Industrial Designers	Electrical Drafters	Importance
Oral Expression	57	57	81
Oral Comprehension	57	59	75
Written Comprehension	57	59	72
Written Expression	50	57	68
Near Vision	53	53	68

Speech Clarity	46	41	62
Problem Sensitivity	50	50	59
Information Ordering	57	55	59
Deductive Reasoning	55	51	56
Inductive Reasoning	50	51	56
Speech Recognition	44	35	53
Mathematical Reasoning	41	42	50
Visualization	51	50	50

Skill Level Comparison - Abilities with importance scores over 69

Description	Commercial and Industrial Designers	Electrical Drafters	Importance
Time Management	67	61	78
Active Listening	57	67	76
Active Learning	63	70	74
Reading Comprehension	69	64	73
Critical Thinking	65	70	69

Knowledge Level Comparison - Knowledge with importance scores over 69

Description	Commercial and Industrial Designers	Electrical Drafters	Importance
Design	77	83	86

Experience & Education Comparison

Related Work Experience Comparison

Description	Commercial and Industrial Designers	Electrical Drafters
10+ years	0%	5%
8-10 years	0%	0%
6-8 years	30%	0%
4-6 years	21%	6%
2-4 years	9%	19%
1-2 years	12%	45%
6-12 months	9%	13%
3-6 months	6%	0%
1-3 months	9%	7%
0-1 month	0%	0%
None	0%	2%

Required Education Level Comparison

Description	Commercial and Industrial Designers	Electrical Drafters
Doctoral	0%	0%
Professional Degree	0%	0%
Post-Masters Cert	0%	0%
Master's Degree	7%	0%
Post-Bachelor Cert	6%	0%
Bachelors	55%	7%
AA or Equiv	18%	19%
Some College	0%	13%
Post-Secondary Certificate	9%	57%
High Scool Diploma or GED	2%	2%
No HSD or GED	0%	0%

Commercial and Industrial Designers	Electrical Drafters
Most Common Educational/Training Requirement:	
Bachelor's degree	Postsecondary vocational award

Job Zone Comparison	
4 - Job Zone Four: Considerable Preparation Needed	3 - Job Zone Three: Medium Preparation Needed
A minimum of two to four years of work-related skill, knowledge, or experience is needed for these occupations. For example, an accountant must complete four years of college and work for several years in accounting to be considered qualified.	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
Most of these occupations require a four - year bachelor's degree, but some do not.	Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.
Employees in these occupations usually need several years of work-related experience, on-the-job training, and/or vocational training.	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.

Tasks

Commercial and Industrial Designers

Core Tasks

Generalized Work Activities:

- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
- Thinking Creatively - Developing, designing, or creating new applications, ideas, relationships, systems, or products, including artistic contributions.
- Updating and Using Relevant Knowledge - Keeping up-to-date technically and applying new knowledge to your job.
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.

Specific Tasks

Occupation Specific Tasks:

- Advise corporations on issues involving corporate image projects or problems.
- Confer with engineering, marketing, production, or sales departments, or with customers, to establish and evaluate design concepts for manufactured products.
- Coordinate the look and function of product lines.
- Design graphic material for use as ornamentation, illustration, or advertising on manufactured materials and packaging or containers.

Electrical Drafters

Core Tasks

Generalized Work Activities:

- Drafting, Laying Out, and Specifying Technical Devices, Parts, and Equipment - Providing documentation, detailed instructions, drawings, or specifications to tell others about how devices, parts, equipment, or structures are to be fabricated, constructed, assembled, modified, maintained, or used.
- Interacting With Computers - Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.
- Evaluating Information to Determine Compliance with Standards - Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Updating and Using Relevant Knowledge - Keeping up-to-date technically and applying new knowledge to your job.

Specific Tasks

Occupation Specific Tasks:

- Assemble documentation packages and produce drawing sets which are then checked by an engineer or an architect.
- Confer with engineering staff and other personnel to resolve problems.
- Determine the order of work and the method of presentation, such as orthographic or isometric drawing.
- Draft working drawings, wiring diagrams, wiring connection specifications or cross-sections of underground cables, as

- Develop industrial standards and regulatory guidelines.
- Develop manufacturing procedures and monitor the manufacture of their designs in a factory to improve operations and product quality.
- Direct and coordinate the fabrication of models or samples and the drafting of working drawings and specification sheets from sketches.
- Evaluate feasibility of design ideas, based on factors such as appearance, safety, function, serviceability, budget, production costs/methods, and market characteristics.
- Fabricate models or samples in paper, wood, glass, fabric, plastic, metal, or other materials, using hand or power tools.
- Investigate product characteristics such as the product's safety and handling qualities, its market appeal, how efficiently it can be produced, and ways of distributing, using and maintaining it.
- Modify and refine designs, using working models, to conform with customer specifications, production limitations, or changes in design trends.
- Participate in new product planning or market research, including studying the potential need for new products.
- Prepare sketches of ideas, detailed drawings, illustrations, artwork, or blueprints, using drafting instruments, paints and brushes, or computer-aided design equipment.
- Present designs and reports to customers or design committees for approval, and discuss need for modification.
- Read publications, attend showings, and study competing products and design styles and motifs to obtain perspective and generate design concepts.
- Research production specifications, costs, production materials and manufacturing methods, and provide cost estimates and itemized production requirements.
- Supervise assistants' work throughout the design process.

Detailed Tasks

Detailed Work Activities:

- analyze market conditions
- analyze project proposal to determine feasibility, cost, or time
- analyze technical data, designs, or preliminary specifications
- communicate visually or verbally
- confer with client or staff regarding theme
- confer with other departmental heads to coordinate activities
- consult with customers concerning needs
- coordinate activities of assistants

required for instructions to installation crew.

- Draw master sketches to scale showing relation of proposed installations to existing facilities and exact specifications and dimensions.
- Explain drawings to production or construction teams and provide adjustments as necessary.
- Measure factors that affect installation and arrangement of equipment, such as distances to be spanned by wire and cable.
- Prepare and interpret specifications, calculating weights, volumes, and stress factors.
- Reproduce working drawings on copy machines or trace drawings in ink.
- Review completed construction drawings and cost estimates for accuracy and conformity to standards and regulations.
- Study work order requests to determine type of service, such as lighting or power, demanded by installation.
- Supervise and train other technologists, technicians and drafters.
- Use computer-aided drafting equipment and/or conventional drafting stations, technical handbooks, tables, calculators, and traditional drafting tools such as boards, pencils, protractors, and T-squares.
- Visit proposed installation sites and draw rough sketches of location.
- Write technical reports and draw charts that display statistics and data.

Detailed Tasks

Detailed Work Activities:

- analyze technical data, designs, or preliminary specifications
- communicate technical information
- compute cost estimates of construction or engineering projects
- conduct training for personnel
- confer with engineering, technical or manufacturing personnel
- create mathematical or statistical diagrams or charts
- direct and coordinate activities of workers or staff
- draw prototypes, plans, or maps to scale
- estimate time needed for project
- examine engineering documents for completeness or accuracy
- inspect manufactured products or materials
- prepare technical reports or related documentation
- read blueprints
- read schematics
- read specifications

- create art from ideas
- distinguish details in graphic arts material
- draw designs, letters, or lines
- draw prototypes, plans, or maps to scale
- estimate production costs
- evaluate product design
- evaluate product quality for sales activities
- fabricate craft or art objects
- follow manufacturing methods or techniques
- identify color or balance
- identify problems or improvements
- maintain consistent production quality
- make presentations
- organize commercial artistic or design projects
- prepare artwork for camera or press
- read blueprints
- recommend improvements to work methods or procedures
- recommend solutions of administrative problems
- schedule work to meet deadlines
- sketch or draw subjects or items
- understand artistic crafts production methods
- use characteristics of graphic design materials
- use computer aided drafting or design software for design, drafting, modeling, or other engineering tasks
- use computer graphics design software
- use computers to enter, access or retrieve data
- use creativity in graphics
- use creativity in industrial artistry
- use creativity to art or design work
- use drafting or mechanical drawing techniques
- use graphic arts techniques
- use hand or power tools
- use marketing techniques
- use product knowledge to market goods

Technology - Examples

Computer aided design CAD software

- Ashlar-Vellum Cobalt
- Autodesk AliasStudio
- Autodesk AutoCAD software
- Autodesk Maya software
- Dassault Systemes CATIA software

- read technical drawings
- understand engineering data or reports
- understand technical operating, service or repair manuals
- use computer aided drafting or design software for design, drafting, modeling, or other engineering tasks
- use drafting or mechanical drawing techniques

Technology - Examples

Charting software

- Microsoft Office Visio

Computer aided design CAD software

- Autodesk AutoCAD software
- Aveva Group Plant Design Management System PDMS
- Bentley AutoPLANT
- Bentley I/RAS B
- Bentley MicroStation
- Bentley PlantSpace SupportModeler
- COADE CADWorx P&ID
- ECT International Raceway Multi-Pack
- Intergraph INtools
- PTC Pro/CABLE
- PTC Pro/ENGINEER software
- PTC Pro/PIPE
- SolidWorks CAD software

Data base user interface and query software

- Microsoft Access
- PEDYN P2000

Office suite software

- Microsoft Office

Project management software

- JD Edwards EnterpriseOne Project Management
- PTC Pro/INTRALINK

Spreadsheet software

- Microsoft Excel

Word processing software

- Microsoft Word

Tools - Examples

- PTC Pro/ENGINEER software
- Siemens PLM Software UGS NX
- SolidWorks CAD software

Data base user interface and query software

- Microsoft Access

Desktop publishing software

- Adobe Systems Adobe InDesign
- Microsoft Publisher
- QuarkXpress

Document management software

- Adobe Systems Adobe Acrobat software

Electronic mail software

- Email software

Graphics or photo imaging software

- Adobe Systems Adobe FreeHand
- Adobe Systems Adobe Illustrator
- Adobe Systems Adobe Photoshop software
- Corel CorelDraw Graphics Suite
- Corel Painter
- McNeel Rhino software
- Xara Xtreme

Internet browser software

- Web browser software

Office suite software

- Microsoft Office

Presentation software

- Microsoft PowerPoint

Spreadsheet software

- Microsoft Excel

Video creation and editing software

- Autodesk 3ds Max
- Chaos Group V-Ray
- MAXON CINEMA 4D
- Softimage XSI

Word processing software

- Microsoft Word

Tools - Examples

- Compasses
- Drafting curves
- Desktop computers
- Drafting machines
- Personal computers
- Protractors
- Steel rules
- T-squares
- Drafting triangles

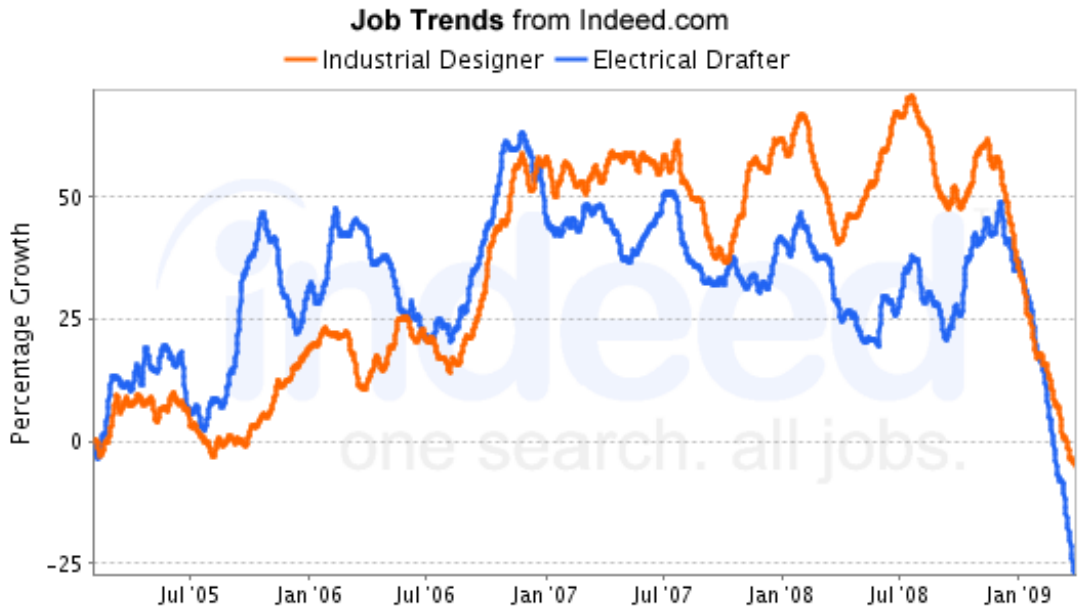
Tools - Examples
• Desktop computers
• Compact digital cameras
• Universal serial bus USB flash drives
• Liquid crystal display LCD video projectors
• Laptop computers
• Personal computers

Labor Market Comparison

Description	Commercial and Industrial Designers	Electrical Drafters	Difference
Median Wage	$ 49,170	$ 44,860	$(4,310)
10th Percentile Wage	$ 29,790	$ 34,650	$ 4,860
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	$ 72,210	$ 52,200	$(20,010)
90th Percentile Wage	$ 81,030	$ 60,240	$(20,790)
Mean Wage	$ 53,870	$ 46,680	$(7,190)
Total Employment - 2007	140	90	-50
Employment Base - 2006	153	90	-63
Projected Employment - 2016	160	76	-84
Projected Job Growth - 2006-2016	4.6 %	-15.5 %	-20.1 %
Projected Annual Openings - 2006-2016	5	3	-2

National Job Posting Trends

Trend for Commercial and Industrial Designers	Trend for Electrical Drafters



Data from Indeed

Recommended Programs

Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD

Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD. A program that prepares individuals to apply technical knowledge and skills to develop working schematics and representations in support of electrical/electronic engineers, computer engineers, and related professionals. Includes instruction in basic electronics, electrical systems and computer layouts; electrode-mechanical drafting; manufacturing circuitry; computer-aided drafting (CAD); and electrical systems specification interpretation.

No schools available for the program

Maine Statewide Promotion Opportunities for Commercial and Industrial Designers

O*NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings
27-1021.00	Commercial and Industrial Designers	100	4	140	$49,170.00	$0.00	5%	5
17-2072.00	Electronics Engineers, Except Computer	87	4	210	$76,420.00	$27,250.00	-26%	4
17-2112.00	Industrial Engineers	87	4	580	$68,350.00	$19,180.00	11%	22
27-1022.00	Fashion Designers	87	3	60	$71,370.00	$22,200.00	19%	1
17-3026.00	Industrial Engineering Technicians	87	3	370	$51,700.00	$2,530.00	6%	9
17-2121.02	Marine Architects	86	4	60	$75,520.00	$26,350.00	-9%	1
17-2131.00	Materials Engineers	85	4	40	$70,250.00	$21,080.00	-7%	1

17-2111.03	Product Safety Engineers	85	5	90	$49,940.00	$770.00	3%	3
15-1051.00	Computer Systems Analysts	84	4	1,650	$69,340.00	$20,170.00	20%	78
11-9041.00	Engineering Managers	84	5	720	$91,030.00	$41,860.00	-2%	14
17-2071.00	Electrical Engineers	84	4	260	$73,050.00	$23,880.00	-10%	6
17-2141.00	Mechanical Engineers	84	4	620	$67,210.00	$18,040.00	-9%	14
17-2111.02	Fire-Prevention and Protection Engineers	83	4	90	$49,940.00	$770.00	3%	3
27-1011.00	Art Directors	83	4	90	$66,570.00	$17,400.00	10%	7
15-1032.00	Computer Software Engineers, Systems Software	82	4	290	$73,410.00	$24,240.00	11%	8

Top Industries for Electrical Drafters

Industry	NAICS	% in Industry	Employment	Projected Employment	% Change
Electrical contractors	238210	9.90%	3,450	3,618	4.86%
Semiconductor and other electronic component manufacturing	334400	6.95%	2,421	2,116	-12.59%
Electric power generation, transmission and distribution	221100	6.73%	2,346	2,157	-8.03%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	5.70%	1,987	1,902	-4.26%
Plumbing, heating, and air-conditioning contractors	238220	5.36%	1,866	2,107	12.93%
Self-employed workers, primary job	000601	4.97%	1,730	1,843	6.54%
Electrical equipment manufacturing	335300	4.78%	1,665	1,415	-15.03%
Wired telecommunications carriers	517100	3.44%	1,198	940	-21.49%
Communications equipment manufacturing	334200	2.85%	994	1,002	0.79%
Other electrical equipment and component manufacturing	335900	1.75%	610	565	-7.34%
Employment services	561300	1.43%	497	629	26.56%
Computer and peripheral equipment manufacturing	334100	1.31%	457	299	-34.54%
Other building equipment contractors	238290	1.14%	397	430	8.38%
Security systems services	561620	1.06%	370	496	34.30%
Management of companies and enterprises	551100	1.03%	358	412	15.28%

Top Industries for Commercial and Industrial Designers

Industry	NAICS	% in Industry	Employment	Projected Employment	% Change
Self-employed workers, primary job	000601	25.29%	12,136	12,929	6.54%
Specialized design services	541400	8.84%	4,243	5,678	33.81%
Management of companies and enterprises	551100	5.03%	2,414	2,783	15.28%
Self-employed workers, secondary job	000602	4.50%	2,158	2,148	-0.45%
Motor vehicle parts manufacturing	336300	2.70%	1,296	1,032	-20.39%
Employment services	561300	2.16%	1,038	1,314	26.56%
Plastics product manufacturing	326100	1.90%	910	965	6.00%
Miscellaneous durable goods merchant wholesalers	423900	1.40%	674	774	14.80%
Advertising and related services	541800	1.37%	657	741	12.83%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	1.13%	541	518	-4.26%
Research and development in the physical, engineering, and life sciences	541710	1.11%	533	569	6.69%
Other general purpose machinery manufacturing	333900	0.94%	452	408	-9.73%
Medical equipment and supplies manufacturing	339100	0.91%	437	447	2.29%
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	333400	0.90%	430	396	-8.01%
Household appliance manufacturing	335200	0.86%	410	311	-24.33%

